ABSTRACTS (MASTER THESIS)

Structural analysis of secreted glycolipids by white-rot fungus

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Continued usage of fossil fuels has caused depleted energy problems and serious environmental issues such as global warming. Therefore, production of energy and chemicals from the most abundant renewable resources, woody biomass is an urgent task for ensuring sustainability of our life. In biological conversion of woody biomass, selective lignin degradation is a key process because cell wall polysaccharides in wood are surrounded by lignin. In nature, the degradation of lignin in wood occurs primarily through the action of lignin-degrading basidiomycetes called white rot fungi; consequently, this ecological group has received a considerable amount of research attention. Most of white rot fungi simultaneously decompose lignin and cellulose, accompanied by erosion of wood cell walls, while some fungi called selective white rot fungi, such as *Ceriporiopsis subvermispora* are able to degrade lignin without intensive damage of cellulose. Thus, a white rot fungus *C. subvermispora* is useful for the production of bioethanol, biomethane, pulp and feed for ruminant animals due to its selective lignin-degrading ability. This fungus secretes hydrophobic metabolites such as fatty acids and alk(en)ylitaconic acids (ceripiric acids). These metabolites play important roles in the selective lignin-degrading system. In this study, secreted glycolipids of the fungus were analyzed. At least two kinds of glycolipids were detected by thin layer chromatography with specific color identification reagent. Detected glycolipids were purified by high performance liquid chromatography (HPLC) and analyzed by hybrid mass spectrometer, LCMS-IT-TOF. Monosaccharide and aglycon moieties of the glycolipids were analyzed by MS^n fragmentation data of ESI-MS with high mass accuracy. After acid hydrolysis followed by extraction and derivatisation, we analyzed the monosaccharide and aglycon moieties of the glycolipids using GC-MS. The secreted glycolipids can be distinguished from those bound in cell membrane, and attract a great deal of interest in their functions in wood decay.